CBCS SCHEME

USN | | | | | | | | | |

15EE32

Third Semester B.E. Degree Examination, Jan./Feb. 2021
Electric Circuit Analysis

Time: 3 hrs. Max. Marks: 80

Note: ***Answer any FIVE full questions, choosing ONE full question from each module.***

Module-1

1 a. Define Passive and Active Elements with example. **(06 Marks)**

b. Determine R_{AB} using star – Delta transformation in the network show Fig Q1(b).

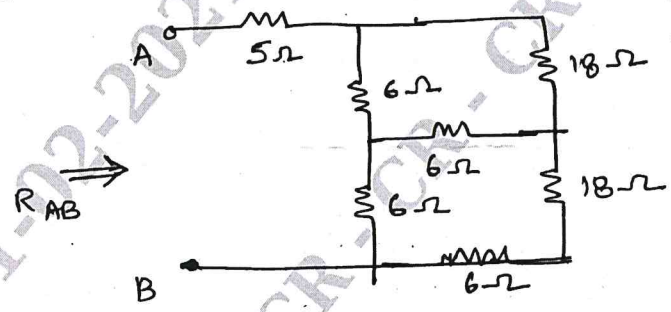


Fig Q1(b) **(10 Marks)**

OR

2 a. A series RLC circuit consists of a resistance is 1kΩ and an inductance of 100mA in series with capacitance is 10pF. If 100V is applied as input across the combination determine :
i) Resonant Frequency ii) Maximum current in the circuit iii) Q factor of the circuit iv) Half power frequencies. **(08 Marks)**

b. Use nodal analysis to obtain current I in the Network shown Fig Q2(b).

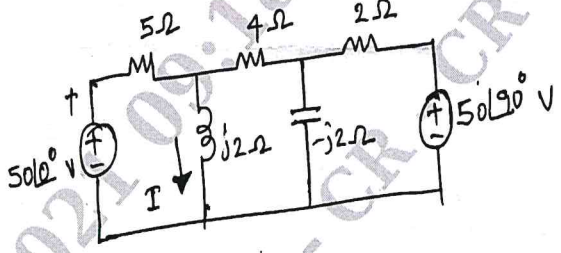


Fig Q2(b) **(08 Marks)**

Module-2

3 a. Using Millmans theorem calculate the current through the load (Ref. Fig Q3(a))

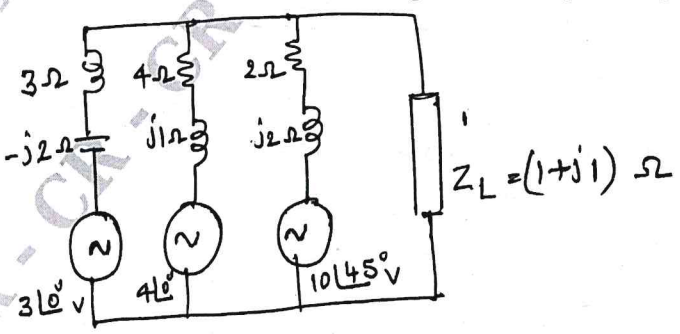


Fig Q 3(a) **(08 Marks)**

b. Using superposition Theorem find the current I for the network shown Fig Q3(b).

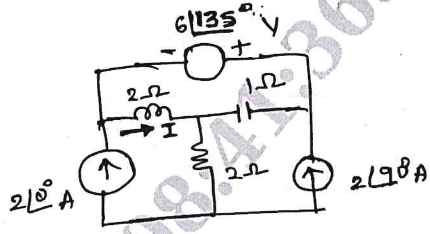


Fig Q3(b) **(08 Marks)**

OR

4 a. In the circuit shown below Q4(a), find the current through $R_L = 7.5\Omega$, using superposition theorem.

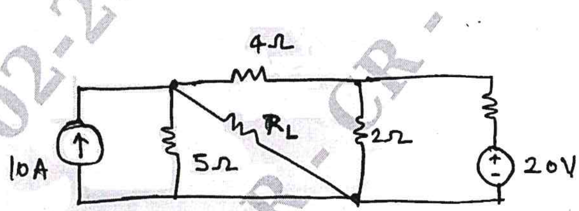
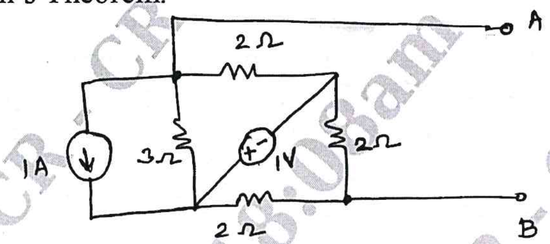


Fig Q4(a) **(08 Marks)**

b. Determine the current through 1Ω resistor connected across AB in the network shown Fig Q4(b). Using Norton's Theorem.



Q4(b) **(08 Marks)**

Module-3

5 a. In the circuit shown in Fig Q5(a), switch 'K' is kept at position A for long time. At t = 0, switch is moved to position B. Find the expression for current for t > 0. Find the value of the current at t = 13.334 msec.

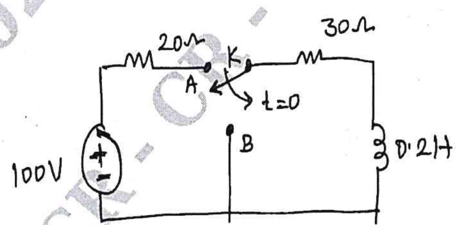


Fig Q5(a) **(08 Marks)**

b. Obtain the expression for current i(t) for t ≥ 0, using time domain approach for the circuit shown in Fig Q5(b).

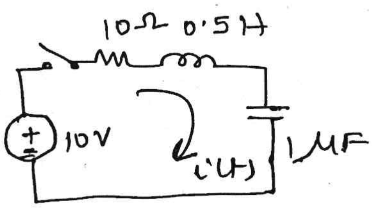


Fig Q5(b) **(08 Marks)**

OR

6 a. The Network shown Fig Q6(a), is under steady state condition with switch K is at position 1 find expression for i(t), if switch K is moved to position 2.

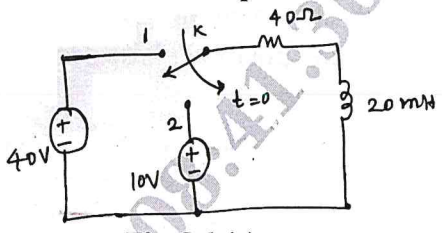


Fig Q6 (a) **(08 Marks)**

b. Find the expression for current in a series RLC circuit fed by a d.c voltage of 20V with $R = 4\Omega$, $L = 1H$, $C = \frac{1}{4}F$. Assume initial conditions to be zero.

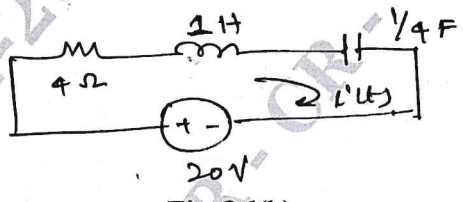


Fig Q6(b) **(08 Marks)**

Module-4

7 a. Express the wave from shown Fig Q7(a), is using of step function

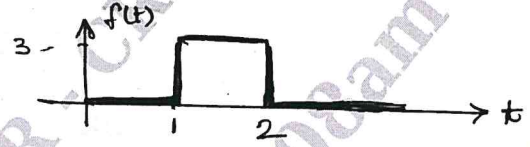


Fig Q7(a) **(06 Marks)**

b. In the series R-C circuit shown Fig Q7 (b), the switch is closed at t = 0. Obtain the expression for current.

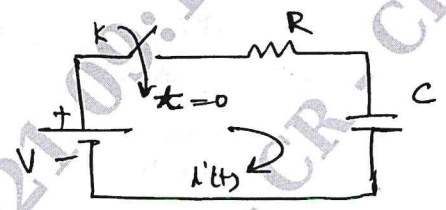


Fig Q7(b) **(10 Marks)**

OR

8 a. Express the waveform shown in Fig Q8(a) in term of standard functions

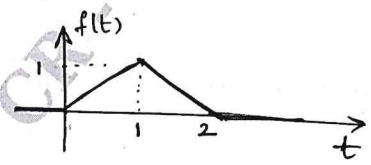


Fig Q8(a) **(08 Marks)**

b. In the circuit shown Fig Q8(b) the switch is closed at t = 0, derive the expression of the resulting current using Laplace Transform

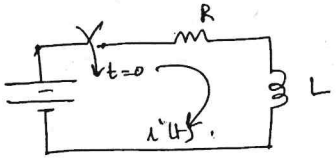


Fig Q8(b) **(08 Marks)**

Module-5

9 a. The balanced load shown in Fig Q9(a), is fed by a balanced three phase system having $V_{ab} = 230 \angle 0°\ V_{rms}$, and position phase sequence, find the reading in each wattmeter and total power drawn by the load.

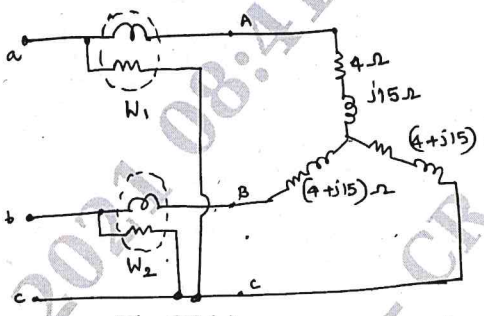


Fig Q9(a) **(08 Marks)**

b. Find the z- parameters for the network shown Fig Q9(b).

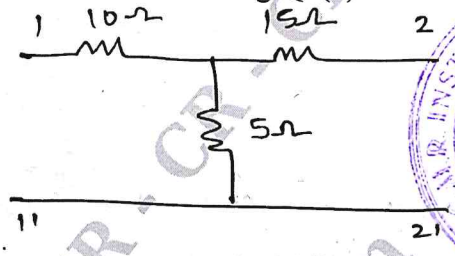


Fig Q9(b) **(08 Marks)**

OR

10 a. For the circuit shown in Fig Q10(a), the loads are $Z_A = 25 \angle 60° \Omega$, $Z_B = 50 \angle -60° \Omega$, $Z_C = 50 \angle 60° \Omega$, $V_{AB} = 600 \angle 0°\ V_{rms}$, and locate point 'x' at C, find P_A, P_B, P_C

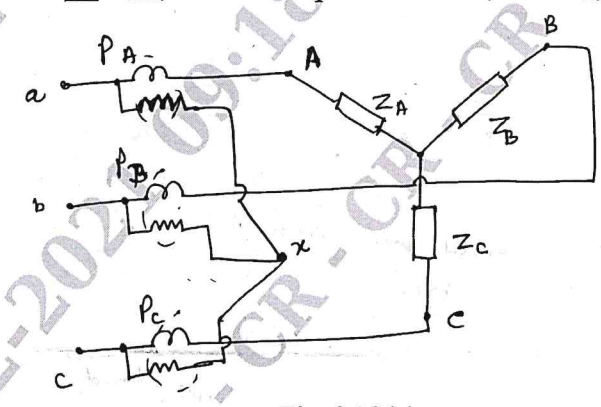


Fig Q10(a) **(08 Marks)**

b. Find Y parameter of the two port Network shown in Fig.Q10(b).

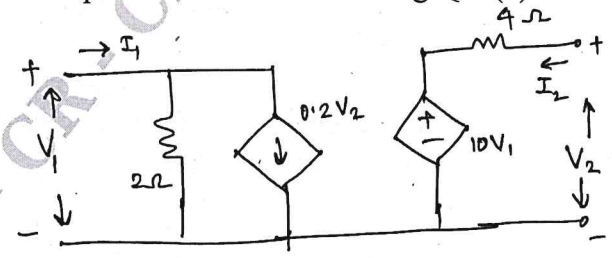


Fig Q10(b) **(08 Marks)**

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